Structuring Rust Programs

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The Problem

Filesystem

1. `src/`

Filesystem

2. `src/mymodule.rs`

Filesystem

3. `src/mymodule/mod.rs`

Filesystem

3. `src/mymodule/{mod.rs, other.rs}`

Keywords

1. `extern crate`

Keywords

2. `mod`

Keywords

2. `pub mod`

Keywords

2. `pub mod mymod {}`

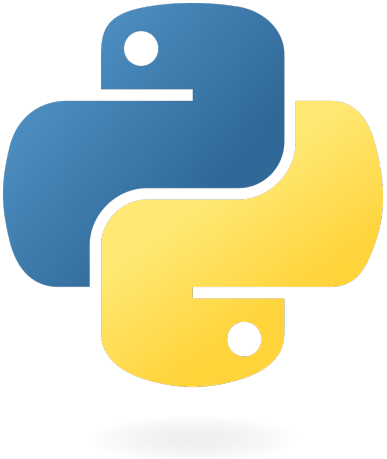
Keywords

3. `use`

Keywords

3. `pub use`

This seems familiar...



(s/mod.rs/__init__.py/)

Applications

`main.rs`

What goes in main?

`main.rs`

1. Keep it small.

`main.rs`

1. Keep it small.
2. Keep it self contained.

`main.rs`

1. Keep it small.
2. Keep it self contained.

But it's already full of `extern crate`...

`main.rs`

"Process-level logic"

main.rs

1. Signal handling

`main.rs`

1. Signal handling
2. Error handling and exit status

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3. Flag / arg parsing

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4. Construction of application wide deps

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main.rs

1. Signal handling
2. Error handling and exit status
3. Flag / arg parsing
4. Construction of application wide deps
    1. Logging
    2. Metrics
    3. ...
5. Initialization and handoff to the application level

main.rs (GTK)

```
fn main() {
    gtk::init().expect(translate!("failed_to_start_gtk"));
    match app::App::new() {
        Err(e) => {
            eprintln!("Error registering app: {:?}", e);
            // Nothing else should ever call process:exit
            process::exit(1);
        }
        Ok(app) => {
            app.run(&args().collect::<Vec<_>>());
        }
    }
}
```

main.rs (web)

```
fn main() {
    let tmpls = Rc::new(compile_templates!("templates/**/*"));
    let logger = myloggersetup(io::stdout());

    // Metrics
    let metrics = prometheus::Registry::new();
    let counter_opts = Opts::new("startup", "Shows app startup");
    let counter = Counter::with_opts(counter_opts).unwrap();
    metrics.register(Box::new(counter.clone())).unwrap();
    counter.inc();

    app::Server::new(tmpls, logger, metrics).serve("127.0.0.1:3000")
}
```

Modules

Modules

`widgets.rs`

`widgets/mod.rs`

File Modules

Save the trees, prefer single file modules.

Block Modules

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Just don't.

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Just don't*.

*Except maybe for tests, at your disgression. Be consistent.

Tree Modules

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mod.rs

```
mod about;
mod app_menu;
mod chat;
mod header_bar;
mod login;
mod roster;

pub use self::about::about_dialog;
pub use self::app_menu::app_menu;
pub use self::chat::Chat;
pub use self::header_bar::header_bar;
pub use self::login::Login;
```

Most Importantly...

Consider the import path.

Common Problems

Consider the import path.

Stutter

```
reader::Reader::new_reader()
```

Stutter

`reader::Reader::new_~~reader()~~`

Stutter

```
reader::Reader::new()
```

Stutter

```
reader::Reader::new()
```

Stutter

```
io::Reader::new()
```

Import Ambiguity

```
main() {
    parse();
}
```

Import Ambiguity

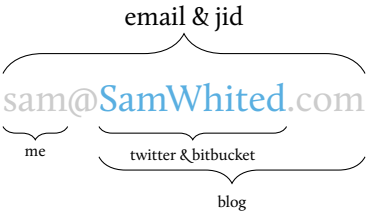
```
use config::parse;

main() {
    parse();
}
```

Import Ambiguity

```
use config;

main() {
    config::parse();
}
```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